

Application Number 10/036,603
Responsive to Office Action mailed April 15, 2005

REMARKS

This amendment is responsive to the Office Action dated April 15, 2005. Applicants have amended claims 39, 55, 65, 73 and 76. Claims 39-77 remain pending upon entry of this amendment.

Claim Rejection Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 39-72 and 76 under 35 U.S.C. 102(e) as being anticipated by Dai et al. (USPN 6,658,016). Applicants respectfully traverse the rejection to the extent such rejection may be considered applicable to the amended claims. Dai et al. (Dai) fails to disclose each and every feature of the claimed invention, as required by 35 U.S.C. 102(e), and provides no teaching that would have suggested the desirability of modification to include such features.

Claim 39-54

Applicants have amended claim 39 to include subject from claim 73 that is not taught or suggested by the prior art, as indicated by the Examiner. In particular, Applicants have amended claim 39 to require a multi-sink port that identifies a destination address in one of said data packet, identifies one or more recipient sink ports in said set of sink ports, and issues a transmission request to said recipient set of sink ports. Consequently, claims 39-54 are in a condition for allowance.

Claims 55-64

Applicants claims 55-64 are directed to a cross bar switch having a set of data rings. In other words, Applicants claims 55-64 are directed to a switch in which the switch itself has a set of data rings. For purposes of clarification, Applicants have amended claim 55 to further require that the set of data rings is "internal to the cross-bar switch."

This is fundamentally different from Dai system in which a plurality of switching devices 12 are coupled in a ring fashion. The Dai system is properly viewed as a ring of switches, i.e., a plurality of switches coupled together to form a ring. For example, FIG. 1 of Dai illustrates four separate and distinct switching devices 12 coupled in a ring-like manner using an external data

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ring 18 and a control ring 24. The data ring 12 includes a plurality of data ring segments each coupling a corresponding adjacent pair of the devices together to ultimately form a ring.

In the Dai system, packets may propagate from switch to switch and ultimately may traverse the ring of switches. As can be seen by FIG. 1, to traverse the ring, a packet must be sequentially propagated by each of the switches. Each of switches 12 in the ring is a separate switch having input and output (sink) ports, and further includes ring interface circuitry so that the switches may be interconnected to form an overall ring of switches.

In contrast, Applicants describe a crossbar switch in which the crossbar switch itself includes internal data rings for transferring packets directly between the input ports and the output (sink) ports of that same switch. For purposes of clarity, Applicants refer the Examiner to Figure 2 of the present application that illustrates an exemplary internal architecture of Applicants' described switch. When properly viewed, the Dai switches that may be connected to form a "ring" are fundamentally different from the internal crossbar switch architecture described and claimed by the Applicant.

Figures 2A and 2B of Dai describe two different embodiments of the individual switches deployed by the Dai system to form the ring. Dai makes clear that, in either embodiment, an individual switch 12 includes a data ring processing circuit 60 and a separate data ring output port 22 for sending and receiving packets to other switches along the external data ring. Dai states that the "data is transferred via the data ring from source ones of the switching devices to corresponding destination ones of the switching devices."¹ Thus, the data rings are external to the switches and transfer data between the switches. It is clear that Dai describes switches 12 that can be connected to form an overall ring. Internally, each switch 12 includes a source management unit coupled to a destination management unit to transfer data packets. Switches 12 do not utilize internal data rings to transfer packets within the switches themselves.

For at least these reasons, Dai fails to teach or suggest a crossbar switch having a set of data rings internal to the cross-bar switch and coupling each sink port in said set of sink ports to each input port in said set of input ports, as required by amended claim 55.

With respect to claim 56, Dai fails to teach or suggest a cross-bar switch where the sink ports and a multi-sink port snoop data packets on each data ring. In Dai, the output ports do not

¹ Dai at col. 9, ll. 2-4.

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handle receipt of packets at all and, therefore, cannot separately snoop or even access the external data ring described by Dai. In contrast, this function is performed by a data ring receiving unit 202 and the data distribution control unit 240 for the entire switch. In other words, the sink ports (output ports) of Dai do not individually snoop packets, as required by Applicants' claim 56. Rather a dedicated receiving unit 202 and control unit 240 perform these functions for the entire switch.

For example, Dai makes clear that the packet routing control unit 302 of the source managing unit 90 is responsible for reading packet header information and determining a destination switching device using the routing table when forwarding packets between switches.² The receiving switch 12 receives packets from other switches via a dedicated a data ring processing circuit 60. More specifically, a data ring receiving unit 202 of the receiving switch 12 forwards packets to data distribution control unit 240, which accepts packets destined for any of the output ports 112 for the entire switch.³ Thus, the output ports 112 do not snoop the data ring. This, of course, further illustrates that the data rings are external to the switch and not even accessible by the individual output ports of Dai. Thus, for at least these reasons, Dai fails to teach or suggest a crossbar switch in which sink port and a multi-sink port snoops on an internal set of data rings.

For at least these reasons, Dai fails to establish a prima facie case for anticipation or obviousness of Applicants' claims 55-64. Withdrawal of the rejection of claims 55-64 under 35 U.S.C. 102(e) is requested.

Claims 65-72

Applicants claims 65-72, as amended, are directed to a method for transferring data packets within a switch. Furthermore, amended claims 65-72 require transferring data packets to a set of data rings internal to that switch, wherein a set of sink ports and a multi-sink port of that switch are coupled to the data rings.

As described above, the Dai system is properly viewed as a ring of switches, i.e., a plurality of switches coupled together to form a ring. For example, FIG. 1 of Dai illustrates four

² Dai at col. 14, ll. 12-36

³ Dai at FIGS. 3A & 3B and related description.

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distinct switching devices 12 coupled in a ring-like manner using an external data ring 18 and a control ring 24. None of the switches of Dai utilize an internal data ring to transfer packets between input ports and sink ports of that switch.

For at least these reasons, Dai fails to establish a prima facie case for anticipation or obviousness of Applicants' claims 65-72. Withdrawal of the rejection of claims 65-72 under 35 U.S.C. 102(e) is requested.

Claims 73-75 and 77

In the Office Action, the Examiner indicated that claim 77 is allowed in its present form, and objected to claims 73-75 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In this amendment, Applicant has amended claim 73, and has included all subject matter recited by the base claims and any intervening claims on which these claims depend. Consequently, claims 73-75 and 77 are in condition for allowance.

Claims 76

Applicants' claim 76 is directed to a cross bar switch having a set of data rings. In other words, Applicants' claim 76 is directed to a switch in which the switch itself has a set of internal data rings. For purposes of clarification, Applicants have amended claim 55 to clarify that the set of data rings is "internal to the cross-bar switch."

As described above, the Dai system is properly viewed as a ring of switches, i.e., a plurality of switches coupled together to form a ring. For example, FIG. 1 of Dai illustrates four distinct switching devices 12 coupled in a ring-like manner using an external data ring 18 and a control ring 24. None of the switches of Dai utilize an internal data ring to transfer packets between input ports and sink ports of that same switch.

For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of Applicants' claims 76 under 35 U.S.C. 102(e). Withdrawal of this rejection is requested.

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CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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By:

July 15, 2005
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